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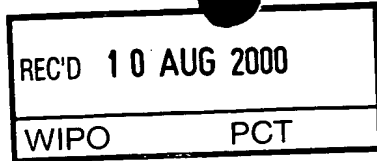
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I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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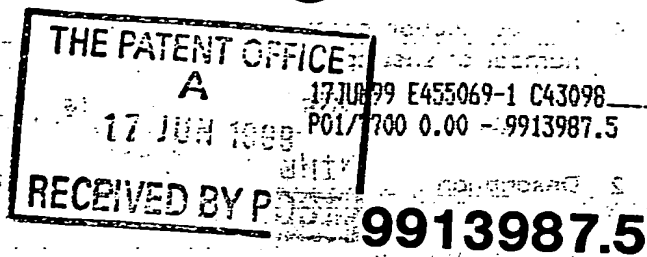
PATENTS FORM NO. 1/77 (Revised 1982)

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REQUEST FOR GRANT OF A PATENT



THE GRANT OF A PATENT IS REQUESTED BY THE UNDERSIGNED ON THE BASIS OF
THE PRESENT APPLICATION

- I Applicant's or Agent's reference (Please insert if available) **AS-2**
- II Title of invention **"METHOD AND MEANS FOR SECURING SCREWS AND BOLTS IN
FIXTURES"**
- III Applicant or Applicants (See note 2) **ALAN STEPHENSON**

Name (First or only applicant) **ALAN STEPHENSON**

Country **UK** State **ADP** Code No. **7216203002**

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Name (of second applicant, if more than one) **Country State**

Address

- IV Inventor (see note 3) (a) The applicant ~~is~~ **are** the **sole/joint** inventor ~~(s)~~
- (b) A statement on Patents Form **No 7/77** is/will be furnished

- V Name of Agent (if any) (See note 4) **DEREK ALAN SENHENN CPA** ADP CODE NO
- VI Address for Service (See note 5) **50 GERARD ROAD, BARNES, LONDON**
24117001 **SW13 9QQ**

- VII Declaration of Priority (See note 6)
- | Country | Filing date | File number |
|---------|-------------|-------------|
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- VIII The Application claims an earlier date under Section 8(3), 12(6), 15(4), or 37(4) (See note 7)
- Earlier application or patent number and filing date

IX Check List (To be filled in by applicant or agent)

A The application contains the following number of sheet(s)

- 1 Request ONE Sheet(s)
2 Description NINE Sheet(s)
3 Claim(s) THREE Sheet(s)
4 Drawing(s) TWO Sheet(s)
5 Abstract ONE Sheet(s)

B The application as filed is accompanied by:-

- 1 Priority document
Translation of priority document
3 Request for Search
4 Statement of Inventorship and Right to Grant

X It is suggested that Figure No. 1 & 6 of the drawings (if any) should accompany the abstract when published.

XI Signature (See note 8)

D A Senhenn

D A SENHENN (AGENT)

NOTES:

1. This form, when completed, should be brought or sent to the Patent Office together with the prescribed fee and two copies of the description of the invention, and of any drawings.
2. Enter the name and address of each applicant. Names of individuals should be indicated in full and the surname or family name should be underlined. The names of all partners in a firm must be given in full. Bodies corporate should be designated by their corporate name and the country of incorporation and, where appropriate, the state of incorporation within that country should be entered where provided. Full corporate details, eg a "corporation organised and existing under the laws of the State of Delaware, United States of America", trading styles, eg "trading as xyz company", nationality, and former names, eg "formerly (known as) ABC Ltd" are *not* required and should *not* be given. Also enter applicant(s) ADP Code No. (if known).
3. Where the applicant or applicants is/are the sole inventor or the joint inventors, the declaration (a) to that effect at IV should be completed, and the alternative statement (b) deleted. If, however, this is not the case the declaration (a) should be struck out and a statement will then be required to be filed upon Patent Form No 7/77.
4. If the applicant has appointed an agent to act on his behalf, the agent's name and the address of his place of business should be indicated in the spaces available at V and VI. Also insert agent's ADP Code No. (if known) in the box provided.
5. An address for service in the United Kingdom to which all documents may be sent must be stated at VI. It is recommended that a telephone number be provided if an agent is not appointed.
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7. When an application is made by virtue of section 8(3), 12(6), 15(4) the appropriate section should be identified at VIII and the number of the earlier application or any patent granted thereon identified.
8. Attention is directed to rules 90 and 106 of the Patent Rules 1982.
9. Attention of applicants is drawn to the desirability of avoiding publication of inventions relating to any article, material or device intended or adapted for use in war (Official Secrets Acts, 1911 and 1920). In addition after an application for a patent has been filed at the Patent Office the comptroller will consider whether publication or communication of the invention should be prohibited or restricted under section 22 of the Act and will inform the applicant if such prohibition is necessary.
10. Applicants resident in the United Kingdom are also reminded that, under the provisions of section 23 applications may not be filed abroad without written permission or unless an application has been filed not less than six weeks previously in the United Kingdom for a patent for the same invention and no direction prohibiting publication or communication has been given or any such direction has been received.

METHOD AND MEANS FOR SECURING SCREWS AND BOLTS IN FIXTURES

5 This invention relates to a method of securing screws and bolts in fixtures, and to means for carrying out that method. In the description and claims that follow hereafter, the term "screws" will include "bolts" as well, and will encompass screws that have screw-threaded cylindrical shanks as well as screws having screw-threaded conical shanks.

10

Devices and appliances are frequently secured to a supporting structure (e.g. a wall, cabinet or panel) by means of screws. In some cases, such screws cannot be screwed directly into the structure because of the nature
15 of the material of the structure, but instead are inserted into a plug of a screw-receiving material that has been previously inserted in a frictionally-engaging manner in a hole preformed in the structure. Driving the screw into the plug tends to radially enlarge the plug, thus causing
20 the frictional engagement of the plug with the structure to intensify and thereby resist both longitudinal and rotational displacement of the plug within the hole as the screw is driven home to firmly secure the device or appliance to the structure.

25

Difficulties can arise in preforming the hole in the structure, for example - where the material of the structure is not homogeneous, or is easily eroded non-uniformly during the drilling of the hole. As a result,
30 the hole is sometimes larger than desired (and/or misshapen) for the size of the plug intended to be engaged therein. This happens for example where the hole is being drilled in mortar bonds between bricks.

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In such cases remedial measures may include using a larger plug to receive the plug originally intended to be used, or simply a larger screw; or alternatively filling the oversized hole with a suitable homogeneous plastic filler

material, and then redrilling the necessary plug-receiving hole in the filler material after it has hardened.

5 Unfortunately, the latter procedure unduly prolongs the time of securing the screw since the hardening of the filler material requires a relatively long setting time before it can safely carry a load. Suitable plastic fillers include epoxy resins, but they are relatively expensive, require special mixing procedures, have long
10 hardening times, and can present problems in safe handling and storage.

The present invention seeks to provide a method and means for securing screws in circumstances where the preformed
15 hole is unfortunately enlarged beyond the intended size, which method and means do not require the use of a larger plug or screw, special chemical compositions, or a long filler-hardening time.

20 According to the present invention, a method of securing a screw-receiving plug in an over-sized preformed hole comprises the steps of: (a) providing at least one piece of a loosely-woven fabric carrying consolidated thereon a dry, water-activated, quick-setting filler material, which
25 fabric piece is sized to envelop at least circumferentially the plug intended to be used; (b) enveloping at least circumferentially the plug in the fabric piece; (c) wetting the fabric piece and filler material carried thereon with water thereby to activate the filler material; and (d)
30 inserting the wetted, enveloped plug in the oversized hole in a manner such as to ensure filling of the oversized hole with the enveloped plug. After the elapse of a relatively short filler-hardening time, the intended screw may be inserted in and screwed into the plug.

35 Preferably, the filler material comprises plaster of Paris, or any other suitable filler material manufactured from gypsum.

5 The fabric piece may be in the form of a tape or strip, and be wound on to the plug thereby to envelop it circumferentially. Alternatively, the fabric piece may be circular in shape, or substantially so, and be placed over the closed end of the plug and then smoothed longitudinally along the plug to the open end thereof so as to envelop it circumferentially in a substantially uniform manner.

10 According to a further aspect of the invention, there is provided for use in the method of the present invention a piece of a loosely-woven fabric material carrying consolidated thereon a dry, water-activated, quick-setting filler material, which fabric piece is in the form of a
15 tape which is transversely weakened at positions spaced along the tape to enable ready detachment of successive pieces as desired for use in practising a method according to the present invention.

20 The tape may be wound in the form of a roll, or alternatively it may be folded upon itself at said weakened positions in a fan-fold manner.

25 Preferably, the fabric tape is enclosed in a water-proof enclosure.

30 Alternatively, there is provided for use in the method of the present invention a water-proof enclosure containing a selection of separate filler-carrying fabric pieces of substantially circular or rectangular configuration, which pieces may be all of one size, or of various sizes to suit different plug sizes.

35 The term 'substantially circular configuration' covers in the ultimate limit fabric pieces that may otherwise be considered as having a substantially square configuration.

Preferably, said water-proof enclosures incorporate water-proof resealing means, and contain or carry printed

instructions setting out the manner of using the fabric pieces in accordance with the present invention.

5 Other features of the present invention will appear from a reading of the description that follows hereafter and of the claims appended at the end of that description.

10 Various methods of securing screws in a fixture according to the present invention, and means for use in practising those methods, will now be described by way of example, and with reference to the accompanying drawings, in which:

15 Figure 1 shows a vertical sectional view of part of an appliance secured to a vertical brick wall by wood screws, the section being taken in the plane including the longitudinal axes of two screws;

Figures 2 and 3 show respectively rectangular and circular pieces of a woven fabric carrying an embedded filler material;

20 Figure 4 shows in a pictorial manner a plastic screw-receiving plug around which is being wound the rectangular fabric piece of Figure 2;

25 Figure 5 shows in a pictorial manner a plastic screw-receiving plug along which is being pressed the circular fabric piece of Figure 3;

Figure 6 shows in a pictorial manner a plastic screw-receiving plug about to be forced longitudinally along with a circular fabric piece of Figure 3 into a hole preformed in the brick wall;

30 Figure 7 shows in a pictorial manner a resealable waterproof enclosure containing several rectangular filler-carrying fabric pieces of the kind shown in Figure 2;

Figure 8 shows in a pictorial manner a filler-carrying woven fabric tape for use in providing as required detachable rectangular fabric pieces of the kind shown in Figure 2, the tape being wound in the form of a roll; and Figure 9 shows in a pictorial manner a filler-carrying woven fabric tape for use in providing as required

detachable rectangular fabric pieces of the kind shown in Figure 2, the tape being folded in a fan-fold manner.

5 Referring now to the drawings, an appliance 10 is to be secured to a brick wall structure 12 in the manner shown in Figure 1, by means of so-called 'wood screws' (i.e screws having screw-threaded conical shanks) 14, using plastic plugs 16 of conventional kind disposed in suitably positioned holes 18,20 preformed in the brick wall 12.

10

The intended positions of some of those holes (18) require drilling in the material of the bricks 22 themselves, so that no difficulty is normally encountered in drilling them to a diameter that is correct for the intended plastic plugs.

15

However, the intended positions of other holes (20) coincide with respective mortar bonds 24 disposed between adjacent bricks 22. Due to the weakness of the mortar often used in such bonds 24, or the presence of small chippings in the mortar, drilling of those holes 20 with the requisite masonry drill can result in holes that are somewhat oversized and/or badly mis-shapen as indicated in Figure 1. As a consequence, the intended plastic plugs 16 are too small in diameter to frictionally engage with the encircling mortar, and so cannot receive and secure the screws intended to be engaged in the plugs. Hence, when a fixing screw 14 is presented to the plug 16 and rotated, the screw and the plug rotate together.

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This difficulty is overcome, in accordance with the principles of the present invention, by providing for each such oversized or mis-shapen hole 20 at least one piece 26 of a loosely-woven fabric (for example - cotton) carrying consolidated thereon a dry, water-activated, quick-setting filler material 28 (for example - plaster of Paris). Each such fabric piece 26 is sized to be capable of enveloping circumferentially at least a major part of the intended

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plastic plug 16 when engaged therearound.

5 The method of the present invention now involves for each plug 16 to be secured in a defective (i.e. over-sized or mis-shapen) hole 20, engaging one such fabric piece 26 securely around the plastic plug 16 so as to closely envelop it circumferentially along its length.

10 The fabric piece 26 and filler material 28 are then wetted with water so as to activate the filler material 28, and thereby initiate its setting (hardening) process.

15 The wetted, enveloped plug (16,26,28) is then inserted without delay into the defective hole 20 so as to substantially fill it, the fabric piece 26 and filler material 28 then occupying the spaces between the plug 16 and the bore of the hole 20.

20 After the elapse of the requisite (relatively short) filler-hardening time, the intended screw 14 is inserted in and screwed into the plug 16. The whole process may require only as little as five minutes.

25 Final tightening of the screw with the appliance in position is normally delayed for a few minutes further, up to ten minutes.

30 The fabric piece 26 may be in the form of a short tape or strip as indicated in Figure 2, and be wound around the plug in the manner shown in Figure 4 thereby in effect to enlarge its diameter.

35 Alternatively, and preferably, the fabric piece is in the form of a circular disc 30 as shown in Figure 3, in which case the disc 30 may be placed against the closed end of the plastic plug 16 and then be smoothed axially along the length of the plug as indicated in Figure 5, thereby to achieve a substantially uniform close engagement of the

fabric piece around the plug.

5 An alternative procedure may be used instead if desired.
Instead of applying the fabric piece 30 (or even 26) to the
plug 16, then wetting it and forcing the plug enveloped in
the fabric piece into the hole 20, the fabric piece 30 is
first wetted to start the hardening process, and then
placed centrally over the defective hole 20, as shown in
Figure 6, whereafter the plug 16 is pressed against the
10 centre of the fabric piece thereby to carry the fabric
piece with plug as it is forced longitudinally into the
defective hole, the fabric piece and filler material again
filling the spaces between the plug 16 and the hole 20.
Any unwanted parts of the fabric which protrude from the
15 hole may be trimmed away with scissors or a craft knife.

Whilst in Figure 3 the fabric piece 30 is circular in shape
(as preferred), other quasi-circular shapes (polygonal for
example) may be used instead, and even substantially square
20 fabric pieces.

Where the oversizing of the drilled hole 20 is substantial,
it may require the use of two (or possibly more) fabric
pieces 26 or 30 lying on top of one another to provide the
25 requisite amount of fabric and filler material to fill the
spaces between the hole 20 and the plug 16. In this case,
the process may require a slightly longer time (possibly as
much as ten minutes) to achieve satisfactory securing of
the plug, depending on how oversized the hole 20 is and
30 thus how many pieces of filler-carrying fabric 26 or 30
need to be used.

For use in practising the method of the present invention,
there may be provided in a suitable water-proof package 32
35 a plurality of fabric pieces 26 or 30 of similar sizes, or
as desired - assorted sizes. The fabric pieces may be
separate one from another, ready for withdrawal one by one
from the package.

Alternatively, the package 32 may enclose filler-carrying fabric in the form of a tape (or strip) 34, which tape has been weakened transversely (e.g. by perforations) at positions 36 spaced along the length of the tape so as to enable separate pieces 38 of the tape to be readily detached. For convenience the tape may be wound in the form of a roll 40 as shown in Figure 8. Alternatively, the tape may be folded repeatedly upon itself at the weakened positions 36 and packaged in fan-fold manner, as shown at 42 in Figure 9.

The packages preferably include closure means (not shown) for resealing them in a water-proof manner after withdrawing a fabric piece.

Preferably, the packages carry within them or externally thereon a set of instructions for using the enclosed fabric pieces in accordance with the principles of the present invention.

It will be appreciated that the method of the present invention may be used in any situation where a plastic plug has to be disposed in any larger-than-desired hole.

Whilst the above description is directed to the securing of a wood screw in a plastic plug, the procedure described there is equally applicable to the securing of such a screw in any form of plug, whether it be of a plastics material, wood, or a metal. Furthermore, the procedure may be used in the same manner for securing plug devices intended for use with plasterboard panels.

Moreover, the procedure described above may equally be used in respect of a bolt having a screw-threaded cylindrical shank and intended to form part of a masonry bolt device, or part of a plug device intended for use with plasterboard panels.

By quick-setting filler material is meant material that has typically a setting time of up to about ten minutes.

5 Fabric for use in practising the present invention may
comprise fibres of cotton, any suitable synthetic plastics
material, or even carbon, and may be woven in any suitable
manner, regularly or randomly. The quick-setting filler
material may be any suitable material derived from gypsum,
and which can be consolidated on and/or within the
10 intertices of the woven fabric.

One form of filler-carrying fabric (as referred to above)
is currently used in the medical field, for the making of
splints and casts. For example, plaster of Paris bandage
15 commercially available under the trade mark CONFORMA from
The Kendall Company (UK) Limited has been successfully used
in experiments with methods according to the present
invention.

20 Methods according to the present invention have the
advantage that they are simple, involve only simple non-
damaging chemical materials, and are relatively swift to
practise.

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CLAIMS

1. A method of securing a screw-receiving plug (16) in an over-sized preformed hole (20) comprises the steps of: (a) providing at least one piece of a loosely-woven fabric (26 or 30) carrying consolidated thereon a dry, water-activated, quick-setting filler material (28), which fabric piece (26 or 30) is sized to envelop at least circumferentially the plug (16) intended to be used; (b) enveloping at least circumferentially the plug (16) in the fabric piece (26 or 30); (c) wetting the fabric piece (26 or 30) and filler material (28) carried thereon with water thereby to activate the filler material (28); and (d) inserting the wetted, enveloped plug (16) in the oversized hole (20) in a manner such as to ensure filling of the oversized hole (20) with the enveloped plug (16).

2. A method according to claim 1, wherein the filler material (28) comprises plaster of Paris.

3. A method according to claim 1, wherein the filler material (28) comprises a quick-setting material manufactured from gypsum, other than plaster of Paris.

4. A method according to any one of the claims 1 to 3, wherein the fabric piece (26) is in the form of a tape or strip, and is wound on to the plug (16) thereby to envelop it circumferentially.

5. A method according to any one of claims 1 to 3, wherein the fabric piece (30) is circular in shape, or substantially so, and is placed over the closed end of the plug (16) and then smoothed longitudinally along the plug (16) to the open end thereof so as to envelop the plug (16) circumferentially in a substantially uniform manner.

6. Means for use in practising a method according to any preceding claim, comprising a piece of a loosely-woven

fabric material (26 or 30) carrying consolidated thereon a dry, water-activated, quick-setting filler material (28), which fabric piece (26 or 30) is shaped and sized for use with a screw of particular size.

5

7. Means according to claim 6, wherein the piece of filler-carrying fabric material (30) is circular in shape, or substantially so.

10

8. Means according to claim 6, wherein the piece of filler-carrying fabric material (26) is rectangular in shape, or substantially so.

15

9. Means for use in practising a method according to any one of the claims 1 to 5, comprising a piece of a loosely-woven fabric material (26 or 30) carrying consolidated thereon a dry, water-activated, quick-setting filler material (28), which fabric piece (26 or 30) is in the form of a tape (34) which is transversely weakened at positions (36) spaced along the tape (34) to enable ready detachment of successive pieces (38) as desired for use in practising any of the methods.

20

10. Means according to claim 9, wherein the tape (34) is wound in the form of a roll (40).

25

11. Means according to claim 9, wherein the tape (34) is folded upon itself at said weakened positions (36) in a fan-fold manner.

30

12. Means according to any one of the claims 6 to 11, wherein the filler-carrying fabric piece or pieces (26,30,38) are enclosed in water-proof enclosure means (32).

35

13. Means according to claim 12, wherein the enclosure means (32) incorporates a water-proof resealable closure means for enabling withdrawal of one or each fabric piece

(26,30,38).

5 14. Means according to claim 12 or 13, wherein the enclosure means (32) carries within or externally thereon printed instructions setting out the manner of using the fabric pieces.

10 15. A method of securing a screw (14) in an over-sized preformed hole (20) comprising a method according to any one of the claims 1 to 5, and a subsequent step, after the elapse of the requisite filler-hardening time, of inserting the screw (14) in the plug (16) and screwing it home therein, the screw (14) being of a size intended for the size of the plug (16).

15 16. A method according to any one of the claims 1 to 5 and 15, substantially as hereinbefore described with reference to, and as illustrated by, the accompanying diagrammatic drawings.

20 16. Means according to any one of the claims 6 to 14, substantially as hereinbefore described with reference to, and as illustrated by, the accompanying diagrammatic drawings.

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ABSTRACT

5 A method of securing a screw-receiving plug in an over-
sized preformed hole comprises the steps of: (a) providing
at least one piece of a loosely-woven fabric carrying
consolidated thereon a dry, water-activated, quick-setting
filler material, which fabric piece is sized to envelop at
least circumferentially the plug intended to be used; (b)
10 enveloping the plug circumferentially in the fabric piece;
(c) wetting the fabric piece and filler material with water
to activate the filler material; and (d) inserting the
wetted, enveloped plug in the hole in a manner such as to
ensure filling of the hole with the enveloped plug. The
filler material comprises a quick-setting material made
15 from gypsum, preferably plaster of Paris. The method
enables a screw to be inserted and screwed home in the plug
after elapse of a short filler-hardening time. The fabric
piece may be in the form of a tape for winding on to the
plug circumferentially; or the fabric piece may be
20 circular in shape, and be placed over the closed end of the
plug and then smoothed longitudinally along the plug.

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Refers Figures 1 & 6.

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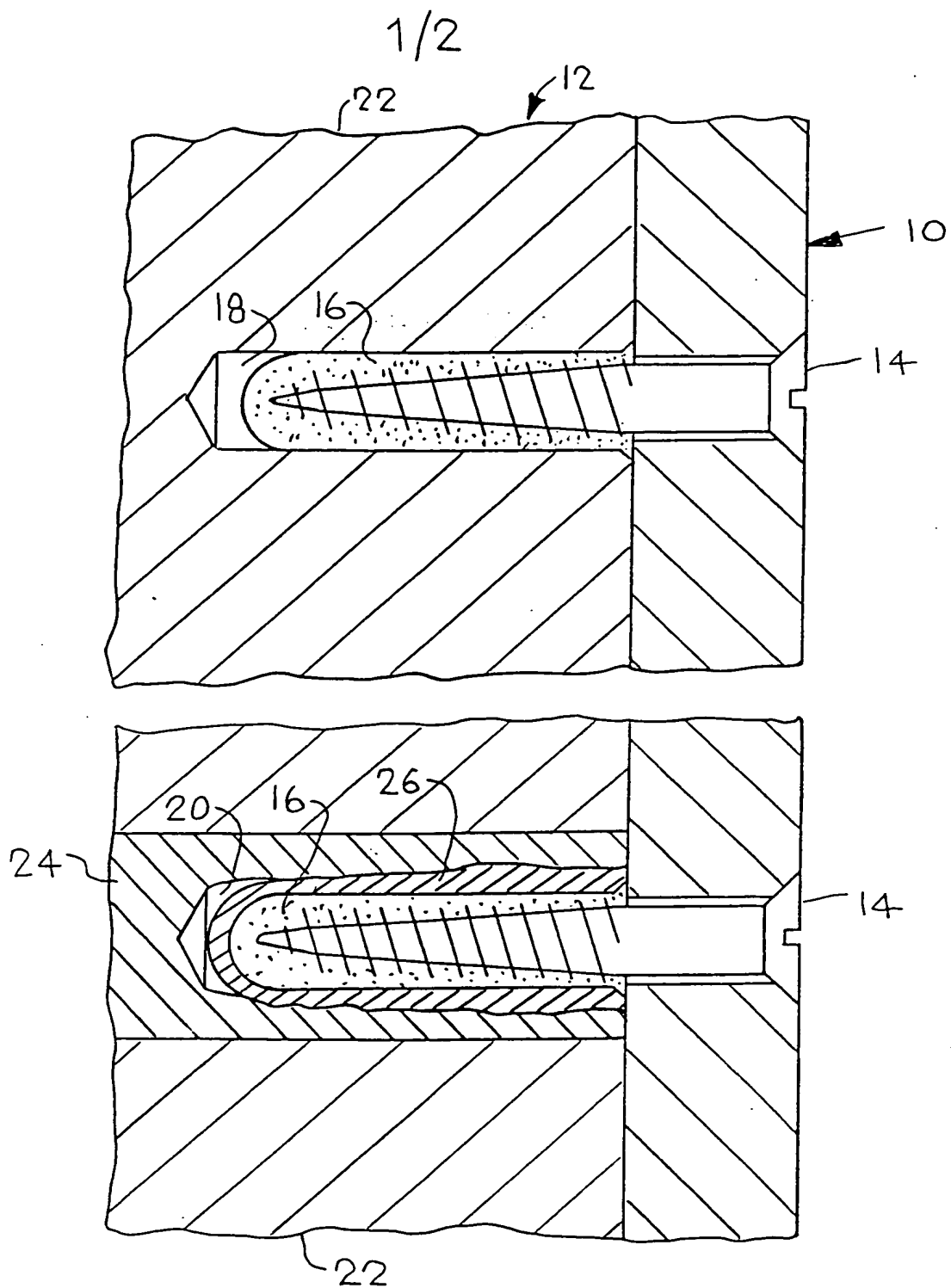
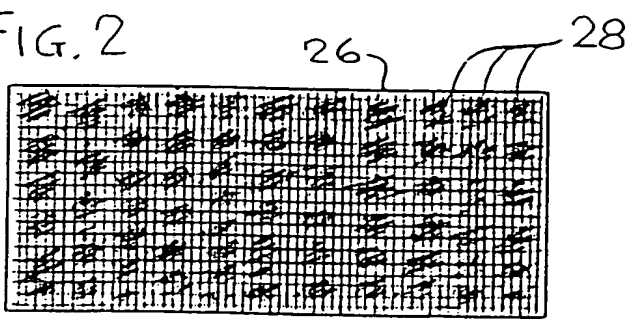


FIG. 1

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FIG. 2



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FIG. 3

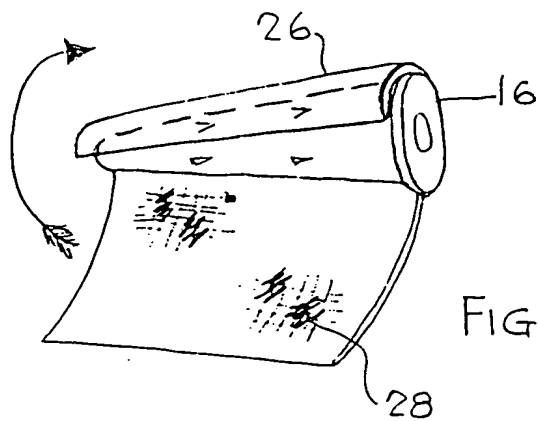
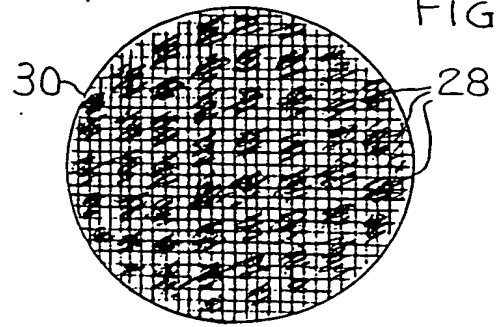


FIG. 4

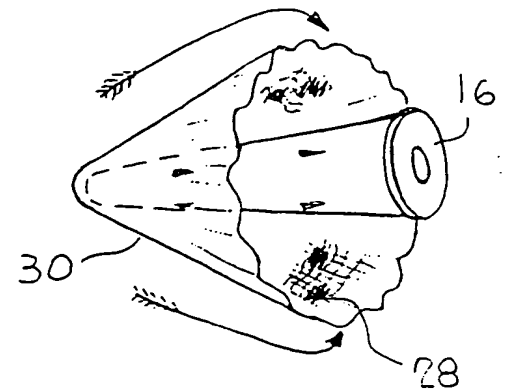


FIG. 5

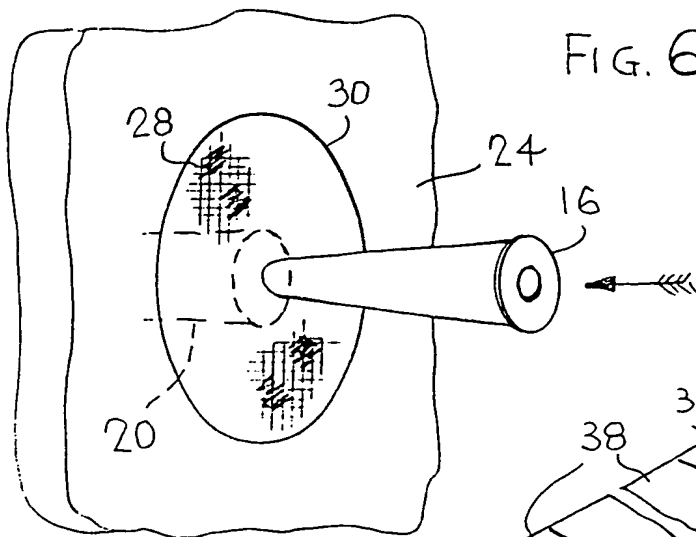


FIG. 6

FIG. 8

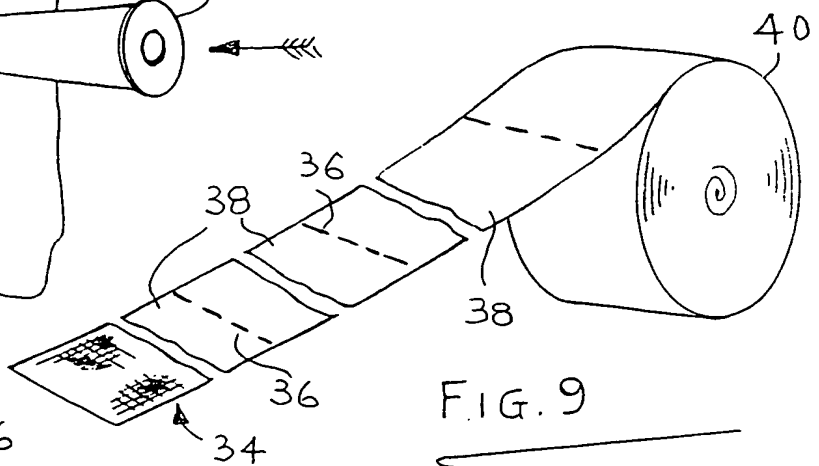


FIG. 7

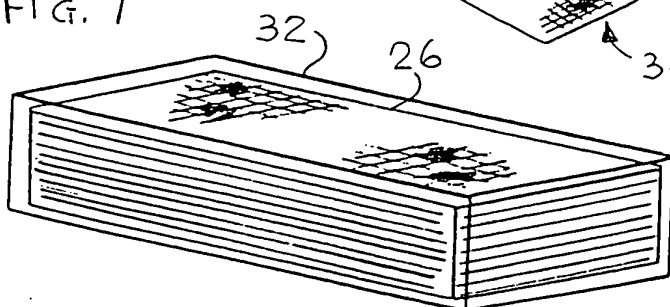
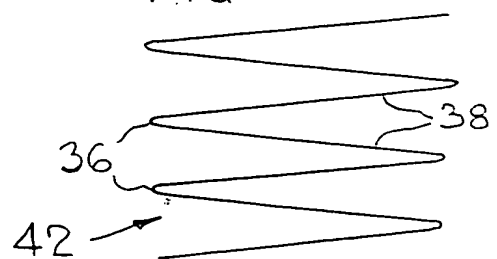


FIG. 9



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